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EXAMINER	
CURS, NATHAN M	

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/597,560	MAIER, MARTIN	
	Examiner	**Art Unit**	
	NATHAN M. CURS	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *24-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *24-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 October 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/06*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claims 24, 33, 34 and 39 are objected to because of the following informalities:

Claims 24, 33, 34 and 39 should be reformatted to be without bulleting.

Claims 34 and 39 have stray parentheses.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 43 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 43 recites that "the optical data signals are placed in a transmit queue when taken from the optical ring network and transmitted from the transmit queue to a tunable transmitter of the source subset node". However, the language "when taken" refers back to the "taking" clause of claim 39, which occurs at the destination ring node,

not the source subset node. Therefore, its unclear what physical and functional relationships are being implied between the transmit queue and the destination ring node, and the source subset node and the destination ring node.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 24, 26-30, 32-42 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill (WO 98/33287) in view of Handelman (US Patent Application Publication No. 2003/0043430).

Regarding claim 24, Hill discloses a hybrid optical network (fig. 6) comprising: a single channel optical ring network (fig. 6 and page 10 line 27 to page 11 line 2, and fig. 7 and page 15 lines 6-12, where the peripheral fiber path reads on one peripheral channel), a plurality of ring nodes of the single channel optical ring network (fig. 6, the switch nodes), each of the ring nodes being adapted to communicate single channel optical data over the single channel ring network (in light of page 13 lines 29-31, where optical data transmitted over the single standby channel is thus single channel optical data), a star sub-network comprising: a central wavelength router having a plurality of input ports and a plurality of output ports (fig. 6 for one of the wavelength routers and

page 10 lines 27-30 and fig. 7 element Wavelength Router and page 15 lines 3-4, applicable for fig. 6), a plurality of combiners each having a plurality of input ports and one output port, the output ports of the combiners being connected to the input ports of the central wavelength router (fig. 7 the combiners that combine the node's TX outputs into one signal toward the Wavelength Router, applicable for each node), a subset of the ring nodes of the ring network, each node of the subset including a tunable transmitter and a tunable receiver to communicate optical data over the star sub-network, the tunable transmitters each being connected to an input port of one of the combiners (figs. 6 and 7, the tunable transmitters and receivers, applicable for each node, and fig. 7, the subset of nodes connected to the Wavelength Router, in light of fig. 2 and page 6 lines 24-29), wherein optical data routed between two ring nodes of the subset over the star sub-network are assigned a specific wavelength that determines the routing of the data packets through the central wavelength router (fig. 2 and page 6 lines 24-32 in light of page 6 lines 3-23, applicable to the fig. 6 embodiment). Hill discloses using ATM for data transmission over the WDM network (fig. 2 and page 7 lines 20-24) but does not explicitly disclose the optical data as packets. Handelman suggests that IP-over-ATM-over-WDM is a known technology (paragraph 0173). It would have been obvious to one of ordinary skill in the art at the time of the invention to use packets by way of IP-over-ATM in the network of Hill, to provide the benefit of supporting IP traffic between nodes in addition to conventional ATM traffic.

Regarding claim 26, the combination of Hill and Handelman discloses the network according to claim 24 or 25, additionally comprising a plurality of wavelength

independent splitters each having one input port and a plurality of output ports, the input ports of the splitters being connected to the output ports of the central wavelength router, the output ports of the splitters each being connected to a tunable receiver of one of the nodes of the subset (Hill: fig. 7 the splitters that split to the node's RX inputs from the Wavelength Router, applicable for each node).

Regarding claim 27, the combination of Hill and Handelman discloses the network according to claim 24, but does not specifically disclose that the nodes of the subset are equally distributed among the ring nodes. However, since the functionality of the subset of nodes and their corresponding wavelength router are not dependent on node geography, one of ordinary skill in the art at the time of the invention could have used a subset of equally distributed ring nodes for a wavelength router, and the results would have been predictable; namely, the wavelength routing would support communication between geographically diverse nodes. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a subset of equally distributed ring nodes for a wavelength router, for the predictable result of the wavelength routing supporting communication between geographically diverse nodes.

Regarding claim 28, the combination of Hill and Handelman discloses the network according to claim 24, wherein an optical amplifier is arranged between the output port of a combiner and the corresponding input port of the central wavelength router (Hill: fig. 6, the Optical Amplifier Chain).

Regarding claim 29, the combination of Hill and Handelman discloses the network according to claim 26, wherein an optical amplifier is arranged between an

output port of the central wavelength router and the input port of the corresponding splitter (Hill: fig. 6, the Optical Amplifier Chain).

Regarding claim 30, the combination of Hill and Handelman discloses the network according to claim 24, wherein each node of the subset comprises conversion means for optical to electrical to optical conversion of the signals, and wherein the tunable transmitter and the tunable receiver of a node perform electrical to optical and optical to electrical signal conversion, respectively (Hill: fig. 6, the WDM transmitters and receivers in light of page 7 line 29 to page 8 line 21).

Regarding claim 32, the combination of Hill and Handelman discloses the network according to claim 24, but does not specifically disclose protocol means for routing optical data packets to be sent from a given source ring node to a given destination ring node over the shortest network path, including routing the data packets over the single channel ring network and over the star sub-network. However, Hill discloses a protocol of using the ring for protection (fig. 7 and page 15 lines 3-14), including in the case of standby spokes for use when working spokes fail (page 11 lines 6-17). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the protection protocol to route traffic from a source node to destination node by way of a transmitting from the source node to a peripheral ring node, through the star hub to an opposite peripheral ring node and from the opposite peripheral ring node to the destination, which is the shortest path in the case of a failure of both spokes that connected the source node to the destination node, in order to provide a protection path in the case of failure of both of the spokes.

Regarding claim 33, the combination of Hill and Handelman discloses the network according to claim 24, additionally comprising: means for assigning a wavelength to data packets being sent over the star sub-network from a given source subset node of the subset to a given destination subset node of the subset, the wavelength determining the route of the data packets through the star sub-network (fig. 2 and page 6 lines 24-32 in light of page 6 lines 3-23, applicable to the fig. 6 embodiment), means for tuning the tunable transmitter of the source subset node to the assigned wavelength, and means for tuning the tunable receiver of the destination subset node to the assigned wavelength (fig. 6, the tunable WDM transmitters and receivers).

Regarding claim 34, the combination of Hill and Handelman discloses the network according to claim 33, but does not specifically disclose that the means for assigning a wavelength comprise: means for determining the shortest route for data packets being sent from a given source ring node to a given destination ring node, means for determining within the shortest route a source subset node and a destination subset node routing the data packets over the star sub-network in a short-cut, means for determining a wavelength to route the data packets from the source subset node to the destination subset node. However, Hill discloses a protocol of using the ring for protection (fig. 7 and page 15 lines 3-14), including in the case of standby spokes for use when working spokes fail (page 11 lines 6-17). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention for the inherent means for assigning wavelengths to also use the protection protocol to route traffic from

a source node to destination node by way of a transmitting from the source node to a peripheral ring node, through the star hub to an opposite peripheral ring node and from the opposite peripheral ring node to the destination, which is the shortest path in the case of a failure of both spokes that connected the source node to the destination node, in order to provide a protection path in the case of failure of both of the spokes.

Regarding claim 35, the combination of Hill and Handelman discloses the network according to claim 33, but does not disclose means for putting the data packets received at the destination subset node on the single channel optical ring network in case the destination subset node is different from the destination node. However, Hill discloses a protocol of using the ring for protection (fig. 7 and page 15 lines 3-14), including in the case of standby spokes for use when working spokes fail (page 11 lines 6-17). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention for the inherent means for assigning wavelengths to also use the protection protocol to route traffic from a source node to destination node by way of a transmitting from the source node to a peripheral ring node, through the star hub to an opposite peripheral ring node, with the opposite peripheral ring node putting the traffic on the ring to reach the destination node in response to not being the destination node itself in the protection path, in order to provide a protection path in the case of a failure of both spokes that connected the source node to the destination node.

Regarding claim 36, the combination of Hill and Handelman discloses the network according to claim 24, wherein the single channel optical ring network is a

bidirectional dual-fiber ring network or a bidirectional single-fiber ring network (Hill: fig .6).

Regarding claim 37, the combination of Hill and Handelman discloses the network according to claim 24, wherein the hybrid optical network is a packet switched network (Hill: fig 2 and page 7 line 20 to page 8 line 3, where the DLE switch elements are packet switches in the IP-over-ATM configuration of the combination). The combination discloses that the network is suitable for a network core (Hill: Abstract), but does not specifically disclose that the network as a metropolitan area network. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the network by simply adjusting the scale down from a core area size to metropolitan area size, and using it in a metropolitan area, to provide the routing advantages of the network for communications between city-wide or metropolitan region client populations.

Regarding claim 38, the combination of Hill and Handelman discloses the network according to claim 24, wherein a passive star coupler is arranged in parallel with the central wavelength router, each node of the subset being coupled both to the central wavelength router and the passive star coupler, and with the central wavelength router routing data packets assigned to wavelengths of a first waveband and the passive star coupler routing data packets assigned to wavelengths of a second waveband (figs. 6 and 7, in light of fig. 2 and page 2 lines 21-23, page 6 lines 24-31 and page 12 lines 18-19, where another of the NxN passive wavelength routers centrally

located with the above cited wavelength router reads on the passive star coupler also connected to the nodes).

Regarding claim 39, Hill discloses a method of routing data between a source ring node and a destination ring node of a hybrid optical network that comprises a peripheral optical ring network with a plurality of ring nodes (fig. 6, where one ring node transmitting is a source node and one ring node receiving the transmission is a destination node and page 10 line 27 to page 11 line 2, and page 13 lines 29-31) and a star network with a central wavelength router and a subset of the ring nodes (fig. 6 for a wavelength router corresponding to the above source and destination nodes and page 10 lines 27-30 and fig. 7 element Wavelength Router and page 15 lines 3-4, applicable for fig. 6, in view of fig. 2 and page 6 lines 24-31, where the wavelength router has an associated subset of nodes including the ring nodes), each node of the subset including means to communicate optical data over the star sub-network (figs. 6 and 7, the tunable transmitters and receivers, applicable for each node), the method comprising: putting data to be transmitted on the optical ring network at the source ring node (fig. 2 element DLE and the transmitters and page 7 line 20 to page 8 line 21, applicable for the above source node), determining a source subset node and a destination subset node of the subset which are part of a route for data being sent from the source ring node to the destination ring node (page 6 lines 3-5, where the transmission wavelength assignment is determined at the source node for communicating with the destination node, and where the subset of nodes includes the source and destination ring nodes). Hill does not specifically disclose pulling incoming source ring node data from the optical ring

network at the source subset node, transmitting the pulled data over the star sub-network to the destination subset node, sending the data from the destination subset node to the destination ring node over the optical ring network if the destination ring node is unequal to the destination subset node, and taking the data from the optical ring network at the destination ring node. However, Hill discloses using the ring for protection (fig. 7 and page 15 lines 3-14), including in the case of standby spokes for use when working spokes fail (page 11 lines 6-17). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to route traffic from a source node to destination node by way of a transmitting from the source node to a peripheral ring node, through the star hub to an opposite peripheral ring node and from the opposite peripheral ring node to the destination, in order to provide a protection path in the case of failure of both spokes that connected the source node to the destination node through the star hub.

Also, Hill discloses using ATM for data transmission over the WDM network (fig. 2 and page 7 lines 20-24) but does not explicitly disclose the optical data as packets. Handelman suggests that IP-over-ATM-over-WDM is a known technology (paragraph 0173). It would have been obvious to one of ordinary skill in the art at the time of the invention to use packets by way of IP-over-ATM in the network of Hill, to provide the benefit of supporting IP traffic between nodes in addition to conventional ATM traffic.

Regarding claim 40, the combination of Hill and Handelman discloses the method of claim 39, wherein the source subset node and the destination subset node are nodes of the shortest route for data packets from the source ring node to the

destination ring node over the hybrid network (Hill: fig. 6, where the subset nodes peripheral to the source and destination ring nodes above, and connected to each other through the star hub by spokes, are part of the shortest path available when the spokes directly connecting the source and destination ring nodes have failed).

Regarding claim 41, the combination of Hill and Handelman discloses the method of claim 39 or 40, wherein the optical ring network is a single channel optical ring network (fig. 7 and page 15 lines 6-12, where the peripheral fiber path reads on one peripheral channel). The combination as described above does not specifically disclose that the optical data packets pulled from the single channel optical ring network are converted in the source subset node to an optical wavelength that allows routing of the data packets to the destination subset node over the star sub-network. However, Hill discloses assigning standby channels to specific wavelengths (fig. 2 and page 9 lines 23-27). For the protection routing case described above using peripheral nodes in routing from source to destination around two direct spoke failures, it would have been obvious to one of ordinary skill in the art at the time of the invention to convert a differing wavelength from the source node to the wavelength of the peripheral node's standby channel for the peripheral node's spoke, in order to match the wavelength of the traffic needing protection to that of the peripheral node's standby channel for routing across the network.

Regarding claim 42, the combination of Hill and Handelman disclose the method of claim 41, wherein the optical data signals on the optical ring network are converted to electrical data signals when taken from the ring (Hill: fig. 6, the WDM receivers in light of

page 7 line 29 to page 8 line 21), and wherein the electrical data signals are converted to optical data signals of a specific wavelength that determines the routing of the data signals across the star sub-network (Hill: fig. 6, the WDM transmitters in light of page 7 line 29 to page 8 line 21 and fig. 2 and page 6 lines 24-32 in light of page 6 lines 3-23, applicable to the fig. 6 embodiment).

Regarding claim 44, the combination of Hill and Handelman disclose the method of claim 42, but does not specifically disclose the additional step of regenerating the signal after conversion to an electrical signal. However, the Office takes official notice that regenerative data recovery devices are well known for optical network receivers for compensating for distortions produced over the distance of the optical transmission. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a regenerative data recovery device with the optical receivers of the combination, to compensate for distortions produce over the distance of the optical transmission.

7. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hill (WO 98/33287) in view of Handelman (US Patent Application Publication No. 2003/0043430) as applied to claims 24, 26-30, 32-42 and 44 above, and further in view of Tanobe et al. ("Tanobe") (US Patent No. 7522837).

Regarding claim 25, the combination of Hill and Handelman discloses the network according to claim 24, and discloses the router as a passive NxN wavelength router (Hill: fig. 6 in light of fig. 4 and page 10 lines 10-17), but does not disclose the

central wavelength router as a single arrayed waveguide grating. Tanobe discloses an inherently passive NxN AWG as a wavelength router (fig. 1A and col. 11 lines 50-63). Since Hill and Tanobe both disclose passive NxN wavelength routers, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute a Tanobe-type NxN wavelength router for the NxN wavelength router of the combination, for the predictable result of passively routing wavelengths.

8. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hill (WO 98/33287) in view of Handelman (US Patent Application Publication No. 2003/0043430) as applied to claims 24, 26-30, 32-42 and 44 above, and further in view of Ogawa (US Patent Application Publication No. 2004/0208177).

Regarding claim 31, the combination of Hill and Handelman discloses the network according to claim 30, and discloses packet transmission (Hill: fig. 2 and page 7 lines 20-24 and Handelman: paragraph 0173 as applicable in the combination) but does not disclose that each node of the subset comprises transit queues and station queues, the station queues comprising receive queues and transmit queues, one receive queue being connected to the tunable receiver and one transmit queue being connected to the tunable transmitter. Ogawa discloses using transmit queues and receive queues for packet traffic (paragraph 0207). It would have been obvious to one of ordinary skill in the art at the time of the invention to use transmit queues and receives queues for the data transmitted and received over the peripheral ring network as well as the data

transmitted and received over the star network, to provide the advantage of prioritizing traffic processing, as suggested by Ogawa.

9. Claims 45 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hill (WO 98/33287) in view of Handelman (US Patent Application Publication No. 2003/0043430) as applied to claims 24, 26-30, 32-42 and 44 above, and further in view of Stevenson et al. ("Stevenson") (US Patent Application Publication No. 2005/0013613).

Regarding claim 45, the combination of Hill and Handelman discloses the method of claim 39, but does not disclose the step of the source subset node transmitting control data with node reservation information to the other nodes of the subset prior to transmitting the data packets over the star sub-network. Stevenson discloses using JIT protocol for transmitting burst packet data over a passive star coupler network, including sending control reservation data to other nodes in advance of data (paragraphs 0010-0012 and 0034-0036). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the network of the combination to use OBS JIT protocol according to Stevenson, including the burst transmission and reception means and the bus controller, for the packet data of the combination, to provide the advantage of switching and transmitting variable length packet bursts on the fly.

Regarding claim 46, the combination of Hill, Handelman and Stevenson discloses the method of claim 45, wherein the node reservation information comprises

data about the source address of the source subset node, data about the destination address of the destination subset node and data about the length of the corresponding data packet (Stevenson: paragraph 0073, where the SETUP message's connection reference number unique to the calling host reads on data about the source address of the source subset node, and paragraph 0066, where SETUP message includes the destination address, and paragraphs 0037, where the "release" provided by the protocol after data transfer is complete indicates the end of the transmission time length).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN M. CURS whose telephone number is (571)272-3028. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NATHAN M CURS/

Primary Examiner, Art Unit 2613